



# Smart Plant Rentals CC

An ENVIRONMENTAL IMPACT ASSESSMENT (EIA) Scoping Report  
Prepared in Support of an Application for an ENVIRONMENTAL  
CLEARANCE CERTIFICATE (ECC) for Gravel Extraction on Farm  
Triangle No. 47, situated in Windhoek Municipality Townlands,  
Khomas Region

**APP- 00150**



PROJECT NAME	
<p>An <b>Environmental Management Plan</b> for the Gravel Extraction on Farm Triangle No. 47, Windhoek Municipality Townlands, Windhoek Khomas Region, Namibia</p> <p>Prepared in Support of an Application for an <b>Environmental Clearance Certificate</b></p>	
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## ABBREVIATIONS AND ACRONYMS

TERM	EXPANSION
BAT	Best Available Technology
COVID-19	'CO' - Corona, 'VI'- Virus & 'D' - Disease of 2019
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
IAPs	Interested and Affected Parties
MAWLR	Ministry of Agriculture, Water and Land Reform
KWR	Klein Windhoek River
MEFT	Ministry of Environment, Forestry and Tourism
MHSS	Ministry of Health and Social Services
NamRa	Namibia Revenue Authority
NHC	National Heritage Council
NSI	Namibia Standards Institute
PPE	Personal Protective Equipment
SHE	Safety, Health & Environment
SME	Small and Medium Enterprises
WGBCL	Windhoek Belt Conservation Landscape
SPR	Smart Plant Rentals
SSC	Social Security Commission
WCF	Workmen Compensation Fund

## DEFINITIONS

TERM	EXPANSION
<b>Assessment</b>	The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making
<b>Builder's Waste</b>	Means any waste generated during the building, construction, repair, alteration, renovation, excavation or demolition of any road, surface, structure, building or premises, and includes builders rubble, earth, vegetation and rock displaced during such building, construction, repair, alteration, renovation, excavation or demolition.
<b>Business Waste</b>	Means any waste generated on any premises used for non-residential purposes, but excluding agricultural properties and small holdings, and does not include general waste, household hazardous waste, garden waste, bulky waste, builder's waste, industrial waste, hazardous waste and health care risk waste.
<b>Council Site</b>	means any waste management, collection, processing, satellite or disposal site operated and/or owned by the Council.
<b>Cumulative Impacts</b>	In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
<b>Disposal</b>	Means the discharge, depositing, dumping, spilling, leaking, placing of waste on or at any premises or place set aside by the Council for such purposes, and "dispose" shall have a similar meaning.
<b>Dump</b>	Means to dispose of waste in any manner other than a manner permitted by law and includes, without derogating from the generality of the foregoing, to deposit, discharge, spill or release waste, whether or not the waste is in a container or receptacle, in or at any place whatsoever, whether publicly or privately owned, including but not limited to vacant land, rivers, waterways, catchments and sewage and stormwater systems. The act of "littering", which retains its ordinary meaning, is excluded from the definition of "dump".
<b>Environment</b>	As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values".
<b>Environmental Clearance Certificate</b>	A certificate and associated conditions issued in terms of the Environmental Management Act, authorizing a listed activity to be undertaken.
<b>Environmental Impact</b>	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
<b>Environmental Management Plan</b>	A working document which contains site project specific plan developed to ensure that environmental management practices to eliminate and control environmental impacts are followed during the developmental phases of that site, project and or facility and would normally consist of construction phase, operational phase and decommissioning phases. Commissioning and Operation phases.
<b>General waste</b>	Means any waste generated on or at any premises used – (a) for residential purposes, and includes agricultural properties and small holdings; or (b) as public and/or private facilities and institutions but does not include garden waste (unless specifically determined or authorised by the Council subject to any conditions or limitations the Council may impose), bulky waste, business waste, builder's waste, industrial waste, hazardous waste and health care risk waste;
<b>Hazardous waste</b>	Means - (a) any waste containing, or contaminated by, poison;

<p>(b) any corrosive agent;</p> <p>(c) any flammable substance having an open flash-point of less than 90 degrees Celsius;</p> <p>(d) an explosive or radioactive material and substance;</p> <p>(e) any chemical or any other waste that has the potential even in low concentrations to have a significant adverse effect on public health or the environment because of its inherent toxicological, chemical, ignitable, corrosive, carcinogenic, injurious and physical characteristics;</p> <p>(f) any waste consisting of a liquid, sludge or solid substance, resulting from any manufacturing process, industrial treatment or the pre-treatment for disposal purposes of any industrial or mining liquid waste, which in terms of any law, order or directive relating to drainage and plumbing may not be discharged into any drain or sewer;</p> <p>(g) the carcass of a dead animal; and</p> <p>(h) any other waste which may be declared as such by Council or in terms of any other applicable law</p>
<p><b>Household hazardous waste</b></p> <p>Means any waste, excluding garden or bulky waste, generated as a result of housekeeping, maintenance or repair activities on or at any premises, or accumulated, stored or deposited on such premises, used –</p> <p>(a) for residential purposes, and includes agricultural properties and small holdings; or</p> <p>(b) as public and/or private facilities and institutions. which by reason of its nature, composition, toxicity, type, quality, quantity or volume causes or may cause a nuisance, public health risk or pollution.</p>
<p><b>Industrial waste</b></p> <p>Means any waste generated as a result of business, commerce, trade, wholesale, retail, professional, manufacturing, maintenance, repair, fabricating, processing or dismantling activities, but does not include general waste, garden or bulky waste, builder’s waste, business waste, hazardous waste or health care risk waste.</p>
<p><b>Minerals</b></p> <p>Means any substance, whether solid, liquid or gaseous form occurring naturally in, on or under any land and having been formed by or subjected to, a geological process.</p>
<p><b>Non-compliance</b></p> <p>Issues that are in direct non-compliance with the requirements, commitments and/or management measures as approved in the EMP.</p>
<p><b>Pollution</b></p> <p>Means any change in the environment caused by –</p> <p>(a) any waste, substance or matter; or</p> <p>(b) noise, odour, dust or heat, emitted from or caused by any activity, including the storage or treatment of any waste, substance or matter, building and construction, and the provision of any service, whether engaged in by any person or an organ of state if that change has an adverse effect on public health or well-being or on the composition, resilience and productivity of a natural or managed ecosystem (both short term and long term), or on material useful to people, or will have such an adverse effect in the future</p>
<p><b>Recovery</b></p> <p>Means the process or act of reclaiming or diverting from waste any materials, products or by-products for the purposes of being reused, or collected, processed and used as a raw or other material in the manufacture of a new, recycled or any other product, but excluding the use for purposes of energy generation.</p>
<p><b>Recyclable waste</b></p> <p>Means waste which has been separated from the waste stream, and set aside for purposes of recovery, reuse or recycling.</p>
<p><b>Recycling</b></p> <p>Means the process or act of subjecting used or recovered waste materials, products or by-products to a process or treatment of making them suitable for beneficial use and for other purposes, and includes any process or treatment by which waste materials are transformed into new products or base materials in such a manner that the original waste materials, products or by-products may lose their identity, and which may be used as raw materials for the production of other goods or materials, but excluding the use for purposes of energy generation, and “recycle” shall have a similar meaning.</p>
<p><b>Recycling Facility</b></p> <p>Means a facility which receives any waste, materials, products or by-products for the purposes of recovery, reuse or recycling, and includes a buy-back centre.</p>
<p><b>Reduction</b></p> <p>Means the process or act of reducing the nature, type, quality, quantity, volume or toxicity of any waste generated, and “reduce” shall have a similar meaning.</p>
<p><b>Refuse container</b></p> <p>Means any receptacle or other container, including a skip, stipulated or approved by the Council from time to time, whether supplied by the Council or not, for the storage, depositing and disposal of waste.</p>

<p><b>Re-use</b></p> <p>Means the process or act of sorting and separating, at the point of origin, different materials found in any waste in order to promote and facilitate recovery, reuse and recycling of materials and resources, and "separate" shall have a similar meaning.</p>
<p><b>Separation</b></p> <p>Means the process or act of sorting and separating, at the point of origin, different materials found in any waste in order to promote and facilitate recovery, reuse and recycling of materials and resources, and "separate" shall have a similar meaning.</p>
<p><b>Storage</b></p> <p>means the temporary storage or containment of any waste for a period of less than 90 days after its generation and prior to its collection for recovery, reuse, recycling, treatment or disposal;</p>
<p><b>Waste</b></p> <p>Means any substance or matter whether solid, liquid or any combination thereof, irrespective of whether it or any constituents thereof may have value or other use, and includes –</p> <ul style="list-style-type: none"> <li>(a) any undesirable, rejected, abandoned or superfluous matter, material, residue of any process or activity, product, by-product;</li> <li>(b) any matter which is deemed useless and unwanted;</li> <li>(c) any matter which has been discarded, abandoned, accumulated or stored for the purposes of discarding, abandoning, processing, recovery, reuse, recycling or extracting a usable product from such matter; or</li> <li>(d) products that may contain or generate a gaseous component</li> </ul>
<p><b>Waste Disposal Site</b></p> <p>Means any facility or site which receives waste for treatment or disposal, and which is authorised to accept such waste, or if such a facility is an incinerator, subject to the provisions of regulation 20, and any possible registration or other permission as may be required by any other applicable law; (CoW Definition).</p>
<p><b>Waste generator</b></p> <p>Means any person whose activities produce any waste and, if that person is not known the person who is in possession and/or control of that waste.</p>
<p><b>Waste Management Plan</b></p> <p>Means a structured document that sets out to record/eliminate/reduce/reuse/recycle the amounts and the types of all waste that is generated in an area or facility.</p>
<p><b>Waste minimisation</b></p> <p>Means any activity, process or act involving the prevention, elimination or reduction of the amount, nature, type, quality, quantity, volume or toxicity of waste that is generated, and in the event where waste is generated, the reduction of the amount, nature, type, quality, quantity, volume or toxicity of waste that is disposed of.</p>



## 1. BACKGROUND INFORMATION

### 1.1 Introduction

Smart Plant Rentals CC (herein after referred to as **SPR**) or (the **Proponent**), is a Windhoek based SME which is planning to establish a small-scale greenfield gravel extraction operation on the Farm Triangle No. 47. The commercial farm is situated on the northwest periphery of the expanded boundary of the Windhoek Municipality townlands in the Khomas Region (Fig. 1). If the intersection of B1 trunk road and the Monte Christo Road is taken as a reference point, the road distance to Farm Triangle is exactly 30 km (Fig. 2 (a)). Access to the farm is provided by a good gravel road, D1499 and the distance from B1 to gravel extraction site is approximately 6 km (Fig. 2(b)).

The gravel resource on Farm Triangle occurs in at least two zones. The present day river channel (Fig. 2 (c) and (d)) consists of the youngest deposited gravel while the primary or oldest gravel occurs at the higher elevation than the current river elevation. The gravel targeted for extraction by SPR is in the older floodplain and occurs up steep, about 200 m from the present day river channel.

### 1.2 Triggered Activity

The activities which may not be conducted without an Environmental Clearance Certificate (ECC) having been granted by the Environmental Commissioner (EC) in the Ministry of Environmental, Forestry and Tourism (MEFT), are listed in the Environmental Impact Assessment Regulations (EIAR) – Government Gazette No 4878 of February 2012.

To this end, SPR has appointed Ekwa Consulting (**Ekwa**) to handle its ECC authorization process.

Table 1: Activities Triggered by the Project

Activity Category	Expansion
Mining And Quarrying Activities	<p><b>Paragraph 3.2:</b> Other form of mining or extraction of any natural resources whether regulated by law or not.</p> <p><b>Paragraph 3.3</b> Resource extraction, manipulation, conservation and related activities not.</p>

### 1.3 Purpose of the EIA

The aim of the environmental impact scoping is to compile adequate information on the envisaged gravel extraction operation in order to assess and determine the potential impacts, both negative and positive, which the aforesaid activity would bring to bear to the biophysical and socio-economic environments.

In the Environmental Management Plan (EMP) practical mechanisms have been recommended on how negative impacts associated with the gravel extraction can be eliminated, avoided, reduced or sufficiently mitigated. The implementation of the EMP by SPR will also ensure that the proposed gravel extraction is operated in a manner that makes it technically sound, economically feasible and environmentally sustainable.

The other purpose of the EIA is also to comply with the Environmental Management Act (EMA) (Act No. 7 of 2007) by providing sufficient information to MEFT so as to allow the EC to make an informed decision on whether to grant SPR:

- with an ECC with conditions;
- with an ECC without any conditions; and or
- to reject the application for the ECC.

The environmental impacts that have been assessed and evaluated are as follow:

- to set up a campsite where machinery, equipment and tools for the operation are stored, parked, etc.
- to allow gravel extraction of up to 10 000 m<sup>3</sup> per year on Farm Triangle,
- to allow for the construction of internal routes to link extraction site to the main gravel road D1499, and
- existing services and infrastructures.

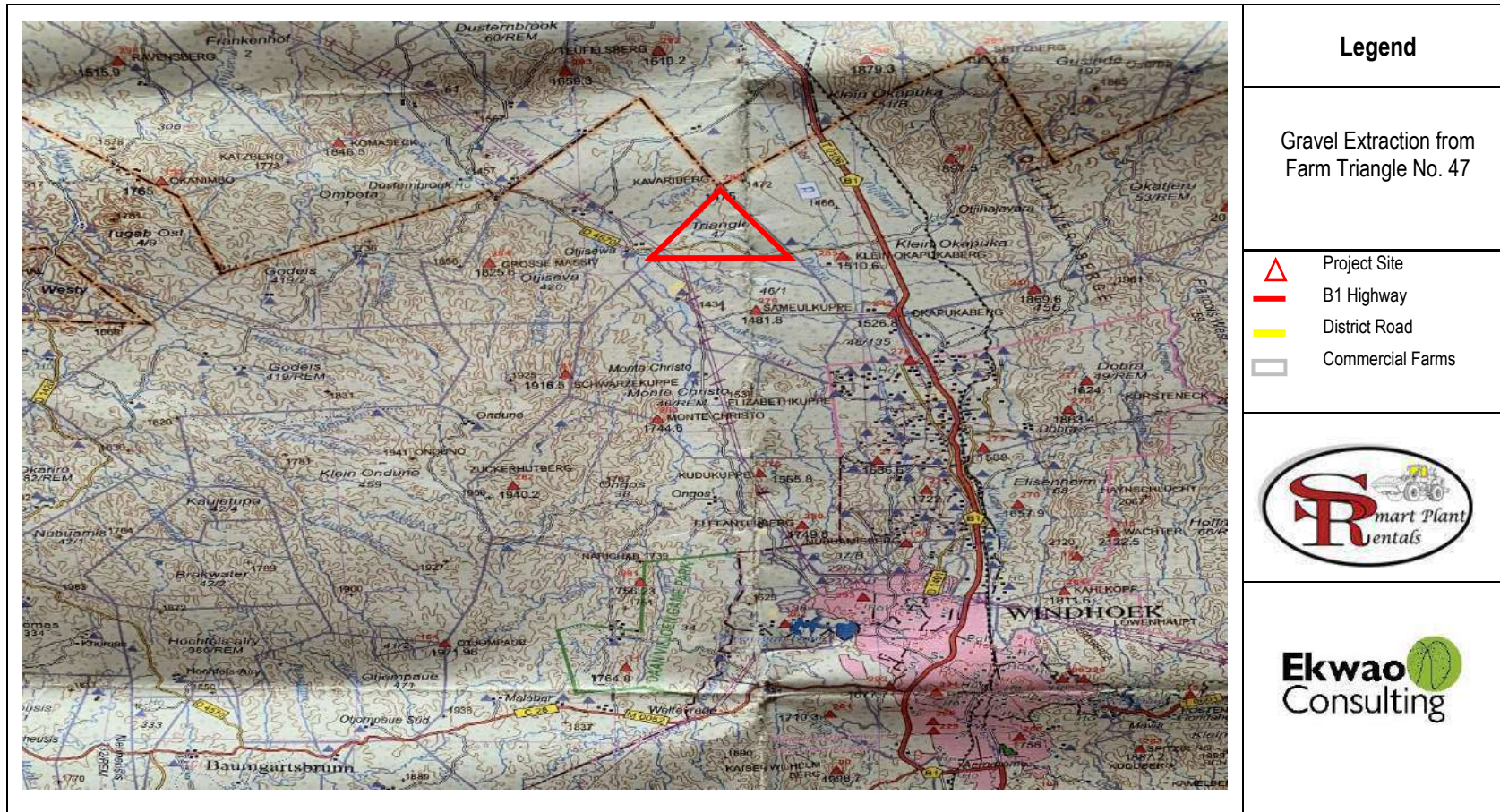


Figure 2: Project Site Location

Figure 1: Project Site Location

## **1.4 Need for the Project**

Aggregate is the lifeblood of the construction and building sectors. For Namibia to achieve its objectives of becoming a developed nation, with the majority of its citizens lifted out of poverty and enjoying a good standard of living as encapsulated in Vision 2030, an adequate supply of good quality aggregates is critically needed for the construction of infrastructure which improve the livelihood of mankind. These are street roads, affordable decent housing, schools, hospitals, highways, street roads, water storage facilities, sport facilities and shopping malls. Aggregate is the basic ingredient in the construction of all such infrastructure.

The quality of gravel used is also a critical component in determining the use and lifespan of the infrastructure. It is therefore of great importance that the aggregates supplied to the built environment is of high quality (meeting all industry standards and specifications), affordable, durable and available for long term supply.

This proposed project will deliver gravel to end-users in Windhoek, but specifically targeting road building and backfilling construction sites. Despite subdued activities in the construction sector, demand for aggregate is still very strong in Windhoek and is likely to continue for many years into the future.

## **1.5 Methodology**

The methodology adopted for this EIA has considered and involved these aspects:

### **1.5.1 Desk studies**

The information on the biophysical environment of the project site and the surrounds was largely sourced from various local publications as well as from previous work done by the EIA Consultant in the same locality. About 18 months ago, Ekwaio has done a similar assignment on Portion 6 of Farm Ongos which is in the same locality.

### **1.5.2 Site Inspection**

Considerable time was spent on the site earmarked for the gravel extraction where the terrain, biophysical characteristics as well as the floral and faunal diversity were assessed and investigated. Several views towards and from various sections of the extraction site were captured. Evidence of some cumulative impacts from previous sand mining activities were observed along the on-channel zones of the Klein Windhoek River (KWR). The operations of SPR will be confined to those gravels deposited in the off-channel zone, i.e. those gravels deposited in the older floodplains, away from the present day KWR.

Two shallow exploration trenches excavated about 1500 m apart were observed from which the extent the gravel depth and volume could be estimated as depicted in Fig. 2 (e) & (f). The farm is served by a good gravel which is the only existing infrastructure (Fig. 2(b)).

### **1.5.3 Public Consultation Process**

Stakeholder engagement is a requirement of sections 21 and 22 of the EIAR and it serves as a platform through which information on the envisaged project is shared with the community. The public consultation process has been presented as a separate report to EIA.

## 2. DESCRIPTION OF THE PROJECT

SPR has secured an agreement with the landowner which allows the company to exploit the huge gravel resource on the farm. The gravel on Farm Triangle is found in at least two zones. The first zone occurs up steep about 200 m from the present-day river channel and consists of those gravels formed in floodplains when the KWR was flowing at a higher elevation. The second zone is the gravel which occurs down steep formed in the recent floodplain including the present-day river channel. Most sand mining activities in Brakwater area of Windhoek are extracting gravels and sand in the recent floodplains.

SPR has identified a huge gravel resource on Farm Triangle which is at a higher elevation than the present-day KWR. This is the gravel that SPR will be extracting to supply to its clients as described more fully in the following section.

### 2.1 Previous Extractions

During the site visit, it was evident that previous mining activities had taken place on the section of KWR which passes through the farm. Mining was mostly for sand and was confined to the active channel and over the banks of the KWR. Groundwater and the riverbed were clearly exposed and still visible during the site visit. It would appear that no rehabilitation was done post-mining as large sections of the riverbank had been left weakened and exposed to erosion. Pooling continues to occur in those areas where mining once took place while erosion activities are widespread all along the weakened river banks. The EIA Consultant was unable to establish if sand mining was done by the landowner or by third parties.

### 2.2 Planned Production

The plan is for SPR to start a greenfield small-scale gravel extraction operation to supply base coarse gravel materials to the road building sector - a niche market which is growing strong within the construction sector of Windhoek. Gravel is only extracted on a project demand basis, i.e. when required for a specific road building contract or when required for the purpose of backfilling a specific site. Extraction volumes, both for base course road building and backfilling materials are not expected to exceed 10 000 m<sup>3</sup> per year.

The gravel production targets as tabulated in Table below are based on the following assumptions:

- The gravel extraction is to be confined to areas measuring about 100 m by 80 m - not exceeding 8 000 m<sup>2</sup> (0.8 ha). This areas should be referred to as gravel extraction blocks and must be clearly demarcated prior to commencing with gravel extraction.
- The topsoil materials from the natural ground level down to a depth of 0.3 m in any gravel block must be treated as overburden which supports vegetation, plants and trees. Such materials must be stripped and stockpiled for future rehabilitation of the gravel block.
- Once the topsoil from a gravel block has been removed and stockpiled, the exposed gravel materials should be extracted down to a depth not exceeding 1.5 m. The approximate area to be excavated over the first three years will amount to about 2.4 ha.

**Table 2:** Gravel Production Plan

THREE YEAR GRAVEL PRODUCTION PLAN					
DETAILS	UNIT	YEAR 1	YEAR 2	YEAR 3	TOTAL
Extraction Block		1	2	3	
Extraction Area	m <sup>2</sup>	8,000	8,000	8,000	24,000
Overburden Depth	m	0.30	0.30	0.30	
Gravel Depth	m	1.50	1.50	1.50	
Overburden Loss	%	5%	5%	5%	
Gravel Loss	%	10%	10%	10%	
<b>Available Overburden</b>	m <sup>3</sup>	2,280	2,280	2,280	6,840
<b>Available Gravel</b>	m <sup>3</sup>	<b>10,800</b>	<b>10,800</b>	<b>10,800</b>	<b>32,400</b>

In the event that SPR has to upscale production beyond the 10 000 m<sup>3</sup> per year or 30 000 m<sup>3</sup> over the first three years of the operation, i.e. beyond the production levels indicated in the Table, the EMP has to be amended to reflect such increases.

### 2.3 Gravel Extraction Activities

The activities related to the gravel extraction will be preceded by a camp site establishment where machinery and equipment will be parked and stored. Other than the access road to the gravel blocks, no permanent structures will be erected at the campsite. Amongst the machinery and equipment that will be used in the gravel extraction are listed here:

The gravel extraction will be performed with the following equipment:

- One x Hydraulic Excavator
- One x Mobile Crusher-Screening Plant
- One x Road Grader
- Two x Tipper end Trucks

Gravel is excavated by a hydraulic excavator loading directly into a mobile crusher-screening plant combination. In the crusher-screening plant, roots and undesirable impurities are screened out while large stones are crushed to the required size fraction in a single stage process delivering G3 base coarse aggregates. The final products are stockpiled ready for delivery to end-users.

There will be some environmental impacts associated with this activity. Mining will be preceded by clearing of vegetation, plants and trees over the area selected for gravel extraction. It is recommended to confine the gravel extraction to blocks not exceeding 0.8 ha that are well planned and clearly demarcated. The topsoil from each block, down to a depth of 0.3 m should be stockpiled aside and preserved for rehabilitation once extractable gravel has been exhausted from the block being mined.

Excavation, crushing and screening are activities associated with dust generation especially when the gravel being handled is in a dry state. Dust impacts can be effectively mitigated.

### 2.4 The Gravel Resource

Based on visual observations and experience of working similar deposits, the gravel resource targeted for exploitation by SPR is quite huge and, at the annual extraction rate of 10 000 m<sup>3</sup> the resource will have a lifespan in excess of 15 years.

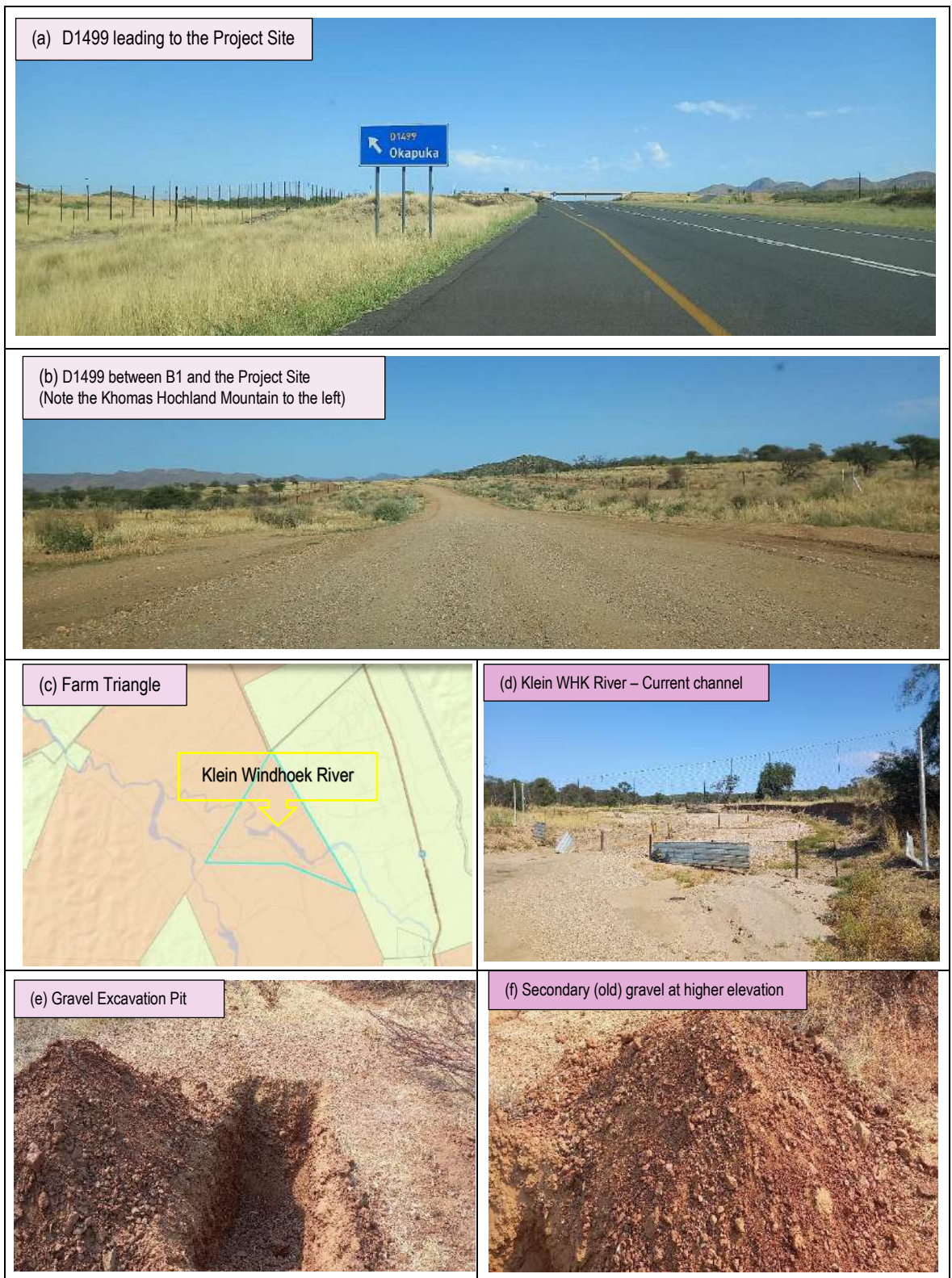


Figure 3: Photos around the Project Site

### **3. CONSIDERATION FOR ALTERNATIVES**

In this section the alternatives considered for the envisaged gravel extraction are described in terms of the following aspects:

- Gravel suppliers
- Proximity to end-users and good infrastructure
- Alternative gravel resource
- The 'No Go' gravel extraction option

#### **3.1 The Gravel Resource**

Various role-players are supplying gravels to the road building construction sector in Windhoek. Such gravel is sourced from several localities such as Farm Aris to the south, Brakwater and Okapuka to the north and within the rural areas of Seeis and Usib River. Most of the traditional gravel sources in the Brakwater area have since been depleted with extraction now focused on resources further afield such as Osona near Okahandja and Farm Aris. The gravel resource on Farm Triangle is therefore closest to end-users than those sourced from further north.

#### **3.2 Proximity to End Users**

At present major developments in the Windhoek municipality are taking place in the Brakwater area (the Elisenheim housing development, the Lafrenz industrial development, Ongos housing development, etc). The gravel resource on Farm Triangle is therefore closest to these development and is accessed by good roads. . Supplying these road building and backfilling materials from this resource has both cost benefits and less environmental impacts in that the haulage distance involved is shorter hence less traffic congestion, less noise and gaseous emissions, etc.

#### **3.3 Alternative Gravel Resources**

The 'no alternative gravel resources was not considered because the proprietor of Farm Triangle has already concluded a binding agreement with SPR. There could possibly be other better gravel resources elsewhere, but such gravel resources are on farms that are privately owned and access to such farms to explore gravel resources is restricted.

#### **3.4 The 'No Go' Gravel Extraction Scenario**

The alternative for 'no go' gravel extraction option from the resource was considered from three perspectives:

- environmental impacts
- social-economic impacts, and
- rehabilitation potential.

#### **3.5 Environmental Impacts**

The impacts on the environment have been evaluated as part of this assessment. Low to moderate impacts are expected in terms of vegetation clearing, loss of riparian habitat and soil erosion. This specific gravel resource is outside the urban area and closest to the sections of Windhoek where significant development activities are currently taking place.

In the EMP formulated for this project, clear mitigation measures have been provided under which a sound gravel mining operation can be carried out by SPR from this location in the best interest of the local economy of the city of Windhoek, the environment and its people. The economic gains from gravel extraction from the resource by far outweigh the limited impacts to the environment.

#### **3.6 Social-economic Impacts**

It is projected that up to twelve (12) people will be directly employed in the gravel extraction operation promoted SPR. However, the positive economic benefits which accrue to the broader society as a result of infrastructure development

supported by the construction materials sourced from the gravel resource are huge and by far outweigh the negative impacts associated with the gravel extraction.

### **3.7 Rehabilitation Potential**

Provided gravel mining is conducted in a responsible manner following a systematic extraction plan and the recommendation proposed in the EMP, the rehabilitation of the excavated trenches to pre-gravel excavation conditions can be successfully accomplished.

## **4. THE LEGAL FRAMEWORK**

### **4.1 Introduction**

The Republic of Namibia has five tiers of law and a number of policies relevant to environmental assessment and protection which include the following:

- The Namibia Constitution
- Statutory law
- Common law
- Customary law, and
- International law

### **4.2 National Policies**

The following policies are applicable and relevant to this EIA:

- The EIA Policy (1995)
- The National Climate Change Policy of Namibia (September 2010)
- The Minerals Policy of Namibia (2004)
- Policy for the Conservation of Biotic Diversity and Habitat Protection (1994)
- The National Development Plans (NDP5)
- The National Resettlement Programme
- The Affirmative Action Loan Scheme Policy
- The National Land Policy
- The National Land-Use Policy
- Land Tax Regulations
- Resettlement Land Act
- The Harambee Prosperity Plan of 2015

As the main source of legislation, the Constitution of Namibia (1990) makes provision for the creation and enforcement of applicable legislations. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and to mitigate against adverse environmental impacts. The environmental regulations are guided and implemented by the EC who heads the Department of Environmental Affairs (DEA) within MEFT.

### **4.3 The Minerals Act on Gravel**

In terms of the Minerals (Prospecting & Mining) Acts (Act No. 33 of 1992) which regulates the prospecting and extraction of minerals in the territory of Namibia, the term 'mineral' is defined as any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land having been formed by or subjected to a geological process, **excluding:**



- Water, not being water taken from land or from the sea for the extraction therefrom of a mineral or group of minerals.
- Petroleum, as defined in Section 1 of the Petroleum (Exploration and Production Act) or
- Subject to provisions of Subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of Schedule 1) if they are bone fide required for purposes of:
  - agriculture, building works, fencing or road making,
  - the manufacture of bricks and tiles,
  - the construction of sports fields, airfields, railways, bridges, dams, reservoirs, weirs, canals or other irrigation works, or
  - any other purpose defined by the Minister by Notice in the Government Gazette.

In subsection 2, the following explanation is provided with respect to gravel:

The Minister may, if he or she is on reasonable grounds satisfied that at any place or on any land in Namibia, soil, sand, clay, **gravel** or stone (other than rock material specified in Part 2 of Schedule 1) is won or mined by any person for purposes of the disposal of such soil, sand, clay, **gravel** or stone to any other person for profit or for use in the course of any business or undertaking, by notice in the Government Gazette declare that any provisions of the Minerals Act specified in such notice shall apply, subject to such conditions, limitations or exceptions, if any, as may be specified in such notice, to such soil, sand, clay, **gravel** or stone at such place or on such land specified in such notice as if such soil, sand, clay, **gravel** or stone were a mineral.

**Table 3: Laws, Policies and Regulations**

Legislations & Policies	Applicable Legislation										
	A	B	C	D	E	F	G	H	I	J	K
The Constitution of Namibia	x	x	x	x	x	x	x	x	x	x	x
Agricultural (Commercial) Land Reform Act, Act 6 of 1995	x						x			x	
Atmospheric Pollution Prevention Ordinance No. 11 of 1976		x	x					x			x
EA Policy for Sustainable Development and Environmental Conservation	x	x	x	x	x	x	x	x	x	x	x
Environmental Management Act , Act 7 of 2007	x	x	x	x	x	x	x	x	x	x	x
Hazardous Substance Ordinance No. 14 of 1974	x	x	x	x				x	x	x	x
Labour Act No. 6 of 1992 - Health and Safety Regulations		x	x	x	x	x	x	x		x	x
Minerals (Prospecting & Mining) Act, Act 33 of 1992	x									x	
National Heritage Act (Act No. 27 of 2004)								x			
Local Authorities Act (Act No. 23 of 1992)							x				
Nature Conservation Ordinance No. 14 of 1975								x			
Pollution Control and Waste Management Bill (Draft of Sept 2003)		x	x	x				x			x
Public and Environmental Health Act No. 86 of 2015		x	x	x	x	x	x	x	x	x	x
Soil Conservation Act (Act No. 76 of 1969)							x	x			
Regulations of the Environmental Management Act, Act 7 of 2007	x	x	x	x	x	x	x	x	x	x	x
Forest Act (Act 12 of 2001)	x						x	x			
Road Traffic and Transport Act ( Act No. 52 of 1999)		x	x	x							x
Water Resource Management Act, Act 11 of 2013	x		x					x			
<b>Legend</b>											
A	Use of natural Resources	H	Biodiversity								
B	Emissions Impact (Air & Odour)	I	Archaeological, Cultural and Heritage Impacts								
C	Emissions (to land & hazard)	J	Social-economic Impacts								
D	Noisy Impacts	K	Health and Safety Impacts								
E	Visual Impacts										
F	Vibrations										
G	Land Use										

## 5. THE RECEIVING ENVIRONMENT

This section provides an overview of those aspects of the natural environment that are considered opportunities or constraints upon the project or those aspects of the natural environment that may be impacted by the gravel extraction activities proposed by SPR. Impacts are considered with respect to the physical, biological and socio-economic environments:

### 5.1 The Physical Environment

#### 5.1.1 Access to the Gravel Resource

Access is provided by a good gravel road which links the farm to the B1 highway. The road distance from the highway to the extraction site is about 6 km long. The gravel road is mostly used by the farming community in the area and is not a formal gazetted public road. The transport of gravel will not increase the traffic flow on the gravel road. likely require the construction of passing places or pullout at intervals to be determined by the promoter. SPR will be required to make short internal routes to link the gravel extraction sites to the gravel road.

#### 5.1.2 Topography and Drainage

When viewed from the southern direction, i.e. from the gravel road running through the farm, the topographic relief over gravel extraction site is quite moderate with the imposing Zuckerhutberg to the northwest corner at 1950 m amsl. The elevation at the ground level is approximately 1760 m amsl which is a drop of approximately 190 m in elevation.

Drainage from the floodplain which makes up a substantial area of Farm Triangle is generally to the northwest towards the Klein Windhoek River which is one of the two main river running through the farmland.

The project site is characterized by the typically Khomas Hochland Plateau and based on the Namibia Vegetation Zones, the project site would fall into the 'Highland Savannah Zone' with biomass yield of approximately 730 kg of dry matter per ha. The vegetation is therefore marginal in terms of carrying capacity for commercial beef production

#### 5.1.3 Climatic Conditions

According to weather-and-climate.com, the project site receives an average annual rainfall of 380 mm. The highest precipitation is received in the summer months from December to February.

The dry months are May, June, July, August, September and October with August being the driest month. November is the warmest month with an average maximum temperature of 30 °C while July is usually the coldest month with an average maximum temperature of 20 °C. Applicable climatic conditions are as shown in Figures 4 to 7. (*Weather-and-climate.com*)

There are no prevailing wind directions and the wind blows in any direction with a slightly greater frequency from the east to the northwest. Calm conditions occur for 60% of the time.

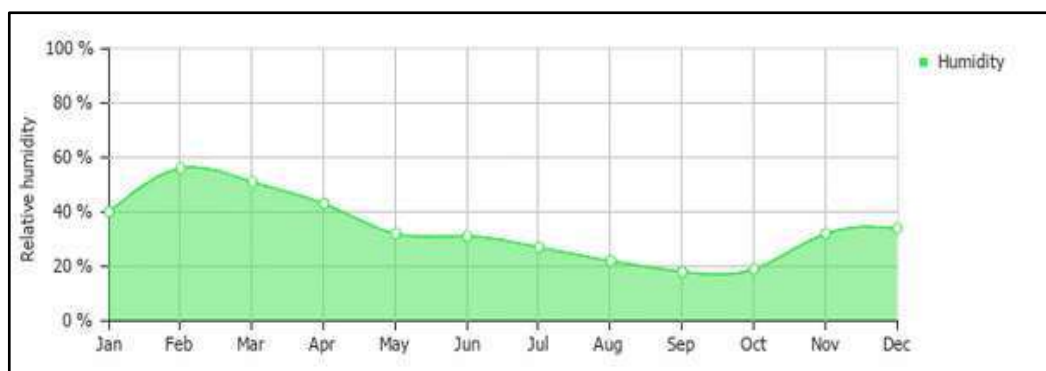


Figure 4: Average Humidity

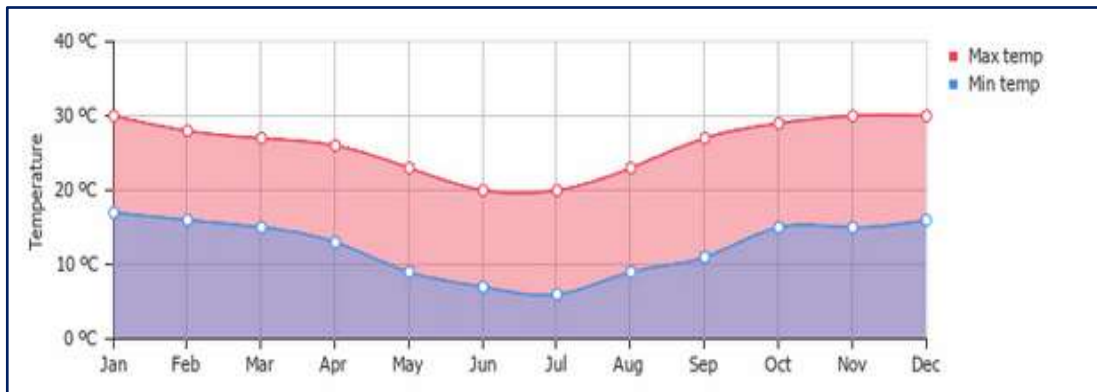


Figure 5: Average Temperatures

## 5.1.4 Geological Overview

### 5.1.4.1 NATIONAL GEOLOGICAL OVERVIEW

Geologically, the history of Namibia is believed to cover just over 2.1 billion years of the existence of planet earth. At that time, the area which is today known as Southern Africa consisted of two main islands – the Kalahari Craton to the South East and the Congo Craton to the North. Over millions of years ago, these islands grew through the creation of mountains exposing greater land mass above the ocean, forming what is today known as the African continent.

The first wave of mountains in Namibia were formed during the Vaalian Age (between 2.1 and 1.6 billion years) and consisted of Epupa Metamorphic Complex, Huab Formation & Grootfontein Formation. The second wave occurred during the Upper Mokolian Age (1.6 to 1 billion years) and resulted in the formation of the Namaqua Metamorphic Complex found in the south of Namibia. During the third wave which happened around 800 million years ago, the Kalahari and Congo Cratons collided giving birth to the Damara Sequence. The area between the cratons had been a shallow ocean where thick carbonate deposits had solidified into limestone. Following the collision, the limestone was transformed into marble by the high temperatures and pressure. These marbles are mined at various localities within the regions of Kunene and Erongo.

Most of the landmasses which make up today's major continents of the Southern Hemisphere including Antarctica, South America, Africa, Madagascar, India, Arabia, Australia, New Guinea and New Zealand occurred during the global plate movements of about 560 million. During this period many areas were pushed together to form the supercontinent Gondwana or Gondwanaland.

The fourth mountain formation in Namibia began around 300 million years ago - the Karoo Age. During this time period, Namibia was closer to the Antarctic and much of the interior was covered by glaciers. After further plate movements, the Gondwana moved closer to the equator and the ice began to melt leaving behind huge amounts of broken down rocks, i.e. the Dwyka Formation in the Kunene which can still be seen to this day. Over time the rocks fell down into lakes and rivers and were naturally transported to widespread deltas – i.e. the Omingonde Formation of central Namibia. Climatic changes followed resulting in dry, hot and sand desert formations – the Etjo Sandstone Formation.

The 5<sup>th</sup> period of geological development in Namibia took place about 65 million years ago when the mountains of the Karoo Age became severely eroded exposing the lower rock layers of the Precambrian age. Between 20 and 10 million years ago, Namibia had a much higher humidity and many rivers than today. This period was followed by relatively calmer conditions which resulted in the formation of the Namib Desert about 5 million years ago. The sand dunes were created about 2 million years and are still evolving.

A geological map of Namibia (modified after Miller and Grote, 1988).

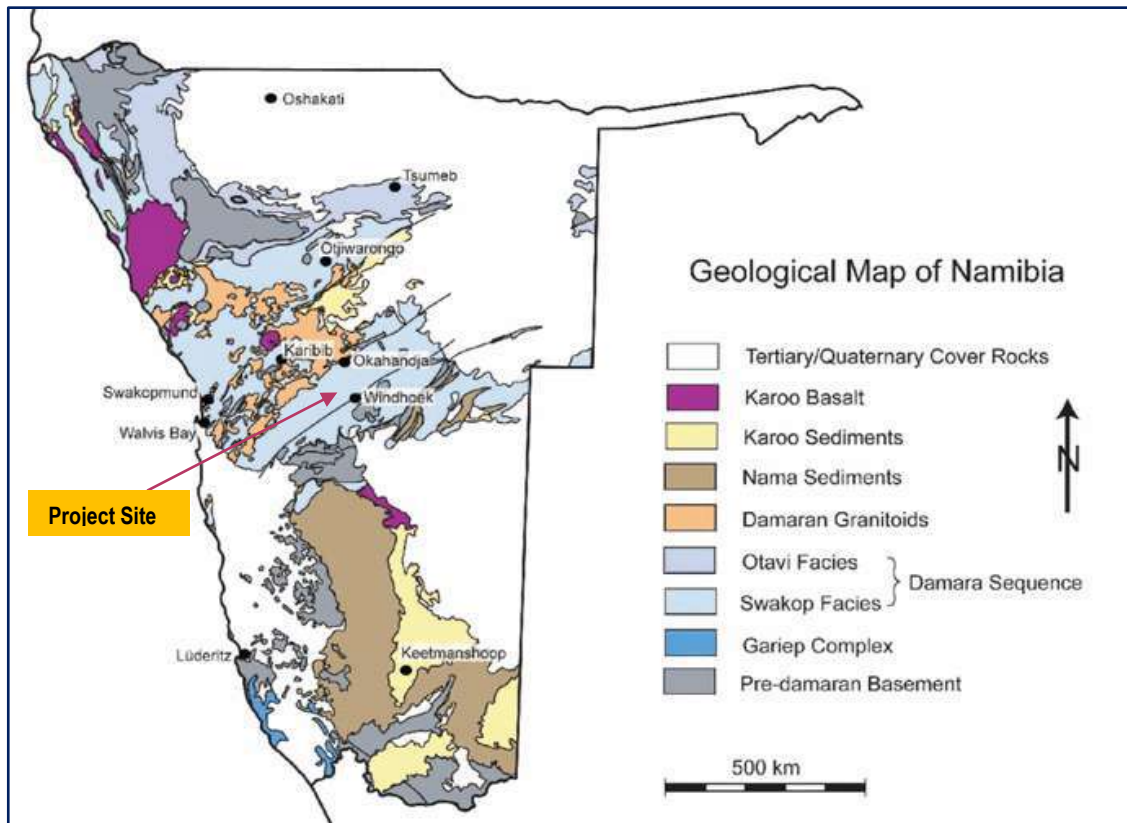


Figure 6: Geological Map of Namibia

#### 5.1.4.2 SITE GEOLOGICAL PERSPECTIVE

The Khomas Highlands were created about 650 million years and are the youngest rocks of the Damara Sequence. They consist of the metamorphic rocks like mica schist, traversed by micaceous quartzite, subordinate calcareous schist and impure marble, and amphiboles schist. Quartz often occurs in drawn out grains to such an extent that a particular form called quartz schist is produced.

Within the project site, the source of gravel is the old channels of the river streams which have natural sand and gravel, consisting of loose grains formed from chemical weathering and physical breakdown of rock. The range of particle sizes is depended on the original texture of the source and state and degree of weathering and breakdown.

#### 5.1.5 Land Uses and Capabilities

The zoning of the land is agriculture and is used primarily for livestock grazing. However, the biomass potential of the Khomas Hochland is comparatively marginal to support commercial beef production. The average farming units in the Khomas Hochland is over 7 000 ha, but Farm Triangle is about 3 000 ha and therefore few livestock is kept. Gravel extraction is one potential source of income to the farm.

#### 5.1.6 Water Resources

##### 5.1.6.1 SURFACE WATER

No surface water or standing water was observed on the farmland. During the wet season, the KWR is the main source of surface water on the farm. The gravel extraction site will be several meters away from the present river channel and contamination of the river is not expected from the operation. The proposed project does not require the use of water except for human use and for machinery & equipment cleaning purposes. This water can either be trucked from Windhoek or sourced from the borehole on the farm.

##### 5.1.6.2 GROUNDWATER

Boreholes are the main source of water supply to the farm. No information was received on the level and depth of groundwater.

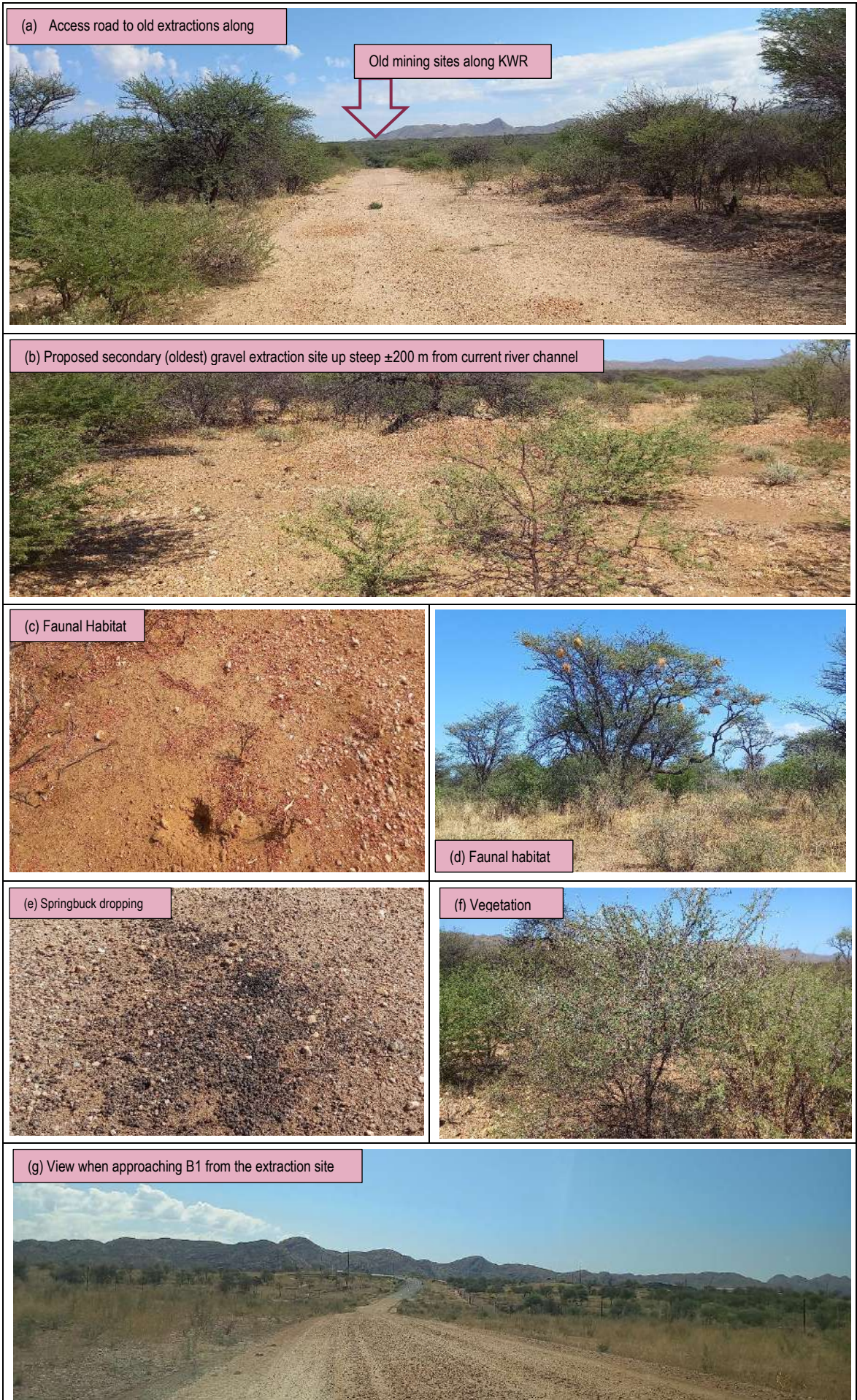


Figure 7: Photos Around the Extraction Site

### 5.1.7 Dust Disturbances

Some dust will be generated during the extraction of gravel materials as well as during the crushing and screening activities. Dust will also be generated during the screening and crushing processes. The scale of the operation is quite small such that any dust generated will not impact on the ambient air quality if the recommendations in the EMP are complied with.

### 5.1.8 Noise Disturbances

The source of noise with respect to gravel mining operation will essentially be from the machinery used in the operation and the crushing and screening actions. However, there are no sensitive noise receptors within a radius of at least 2 000 m of the gravel extraction site.

### 5.1.9 Visual Intrusions

Farm Triangle is accessed via a single gravel road which is used exclusively by the farmers in the area. The distance of gravel road between gravel extraction site and B1 highway is about 6 km. Beyond the farming residents, the gravel road is used by few people on a daily basis. Within the radius of 4 000 m (3 km) of the aggregate production facility, the various poultry infrastructure on the Namib Poultry Industry are the predominated features dominating the landscape to the southeast and northeast. Visual impacts are therefore considered to be minimal.

### 5.1.10 Archaeological, Heritage & Cultural Aspects

According to De Villiers H, 1972, *'The first human skeletal from South West Africa'* Transactions of the Royal Society of South Africa 40 (3) 187-196. In 1964, while doing routine maintenance work on the Farm Otjivera 42, situated just south of Farm Triangle, fossilized human remains were discovered, which, upon testing, were found to be over 3 000 years. The report is described as follows:

*'The remains are essentially Khoisanoid in character but show a blend of the small-headed, short-statured Bush variety and of the large robust variety. If the skeleton is old enough, it may represent a type of proto-Khoisanoid, or even a type of proto-negriform, from which the Khoisan and Negro people diverged. Or, if the remains are more recent than the date at which the proto-Khoisanoids dichotomized into derivative Bushman and Hottentot populations, they may represent a little-changed survivor of the ancestral population.'*

In addition, rock paintings are found on a number of farms in the Khomas Hochland area. There are no known items of archaeological interests on Farm Triangle.

## 5.2 The Biophysical Environment

Most of the information provided under this section is sourced from the studies done for the Windhoek Green Belt Conservation Landscape (WGBCL) which covers a surface area of approximately 170 000 ha including about 20 private game and cattle farms. The WGBCL overlaps substantially with the Khomas Hochland Conservancy and was registered as a conservancy in 1992. Farm Triangle is covered by the WGBCL but registered as a non-active member.

### 5.2.1 Floral Diversity

According to comments provided for this EIA by a Windhoek based botanist, by Ms Coleen Mannheime, are that, the river banks, floodplains and valleys around Windhoek are the preferred habitats for *Acacia erioloba*, a protected species, as well as other protected tree species.

Considerable impact has been caused on those species along the KWR valley in the northern industrial area and Brakwater. In the near future, the *Acacia erioloba* species and some protected tree species on the farms: Ongos, Otjisewa, Monte Christo and Groot Aub will face the safe fate. Any sand mining and residential development on these farms without taking these trees into consideration and applying suitable protection measures and requirements are of very high concern.

*Acacia erioloba* is a 'keystone species', regarded as one that has a disproportionate effect on its environment relative to its biomass. Its removal initiates significant changes in the ecosystem structure and loss of overall biodiversity due to losses of resources such as food, shade, perching and nesting sites.

Mannheime further commented that loss of large woody species will result in erosion, increasing runoff from the lowlands and alluvial plains, thus reducing aquifer replenishment. Uncontrolled sand and gravel mining without suitable mitigation measures is a major concern.

The sand mining that has been done on farms Monte Christo and Gross Okapuka has been extremely damaging. The damage is even visible on satellite images taken over such properties. It would seem sand mining on such properties has been unmitigated and uncontrolled.

The botanist strongly urged sand harvesting throughout the Windhoek Townlands to be strictly controlled. It is not acceptable to remove all sand right up to within a metre or two of a tree base and expect it to survive. Appropriate EIAs stipulating mitigation measures, such as building weirs to capture sand in areas that are to be, or have been harvested, as well as allowing a broader base of sand around trees to be retained are absolutely a priority.

## **5.2.2 Faunal Diversity**

### **5.2.2.1 MAMMALS**

Within the WGBCL there are at least 75 species of mammals on the landscape. Of the mammals, six (6) species are endemic to Namibia. Recorded mammals include (2 species) hedgehog, elephant shrews (3), bats (13), bushbaby, baboon and pangolin, hares/rabbits (3), mole, squirrels (2), porcupine, springhare and dassie rat, rats and mice (17), carnivores (17), aardvark, rock dassie, warthog and antelopes (7).

### **5.2.2.2 REPTILES**

At least 78 species of reptiles have been recorded within the landscape, comprising at least 36 snakes, (3 blind snakes, 1 thread snake, 2 pythons, 5 burrowing snakes and 25 typical snakes) of which 8 are endemic to Namibia. Also recorded were 2 tortoises, and 1 terrapin and 34 lizards, with 13 of these being endemic to Namibia.

### **5.2.2.3 AMPHIBIANS**

The occurrences of at roughly 13 species of amphibians have been recorded within the wider WGBCL landscape. They include 3 species of toads, 2 rubber frogs, 2 puddle frogs and 1 each for bull frog and sand frog, kassina, rain frog, cacos and platanna. The last three species are endemic to Namibia.

### **5.2.2.4 ARTHROPODS**

Arthropods are invertebrates with exoskeleton, segmented body and jointed limbs. They include the insects, arachnids, and crustaceans and are vital components in the cycling of nutrients throughout the ecosystem. A diverse arthropod fauna occurs with many species which are specially adapted to the particular environmental conditions in the area. Many species are considered threatened by habitat degradation and the impacts of agriculture, alien species and pollution.

### **5.2.2.5 BIRDS**

Within the said landscape, bird diversity is high and the species present include many of Namibia's endemic bird species such as Rüppell's parrot, Monteiro's hornbill, rockrunner and white-tailed shrike. Other notable species recorded include the blackfaced waxbill, short-toed rockthrush, whitebacked mousebird, Cape penduline tit, ashy tit, shaft-tailed whydah, and cinnamon breasted bunting. Over 300 bird species have been recorded within the landscape. One of the main features of the Daan Viljoen Game Park is the reservoir around which the bungalows and picnic sites are situated. As this is a permanent source of water, it attracts bountiful birdlife and other wildlife.

## **5.2.3 The Socio-economic Environment**

As of 2020, Windhoek has a population estimated at 431 000 and by 2030 the population is projected to grow to 634 000. According to a recent presentation on the Harambee Prosperity Plan by Dr Mwinga of First Capital, there are ±42 000 shack structures in Windhoek in which over 120 000 people live. There is therefore huge demand for affordable housing in Windhoek which requires the supply of construction materials. The project is projected to provide year round employment to at least twelve (12) people during the first year of its implementation. If it is assumed that each employed person supports on average of four (4) other people, then close to forty eight (48) people are likely to benefit from the gravel extraction operation.

## 6. IMPACT ASSESSMENT METHODOLOGY

The objective for the assessment of impacts is to identify and assess all possible significant impacts that may arise from the proposed gravel extraction operation. At the same time, the findings are presented to MEFT to allow the Environmental Commissioner to make an informed decision of whether the gravel extraction project as proposed by SPR should be:

- permitted to take place or not permitted,
- authorized with conditions that mitigate identified impacts within acceptable levels, and
- or the application altogether rejected.

In this regard impacts are defined as the changes in an environmental parameter that results from undertaking an activity. These changes are the difference between the effects on an environmental parameter where the activity is undertaken compared to where the activity is not undertaken, and occur over a specific period and within a defined area (EMA, 2007).

### 6.1 Types of Impacts

In general, different types of impacts may occur from undertaking an activity, which may be:

- positive or negative impacts;
- direct impact or primary;
- indirect impact or secondary, and/or
- cumulative impacts.

Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (for example, dust generated as a result of sand being loaded into a tipper truck). These impacts are usually associated with the operation and maintenance of a development or activity and are therefore conspicuous evident and quantifiable.

On the other hand, indirect impacts are induced changes that may occur as a result of the activity or development. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

### 6.2 Identification of Impacts

The identification of potential impacts associated with an activity on the environment should include impacts that may occur during the three phase of the development:

- Construction phase;
- Operational phase, and
- Decommissioning phase.

The process of identification and assessment of impacts could, inter alia, include the following:

- Determination of current environmental conditions in sufficient detail so that there is a baseline against which impacts are identified and measured.
- Determination of future changes to the environment that will occur if the proposed activity does take place.
- Understanding of the activity in great details so as to understand its consequences.
- Identification of significant impacts that are likely to occur if the activity is undertaken.



### 6.3 Mitigation of Impacts

Once impacts have been identified or predicted for a particular activity, appropriate mitigation measures have to be established. Mitigation measures are the modification of certain activities in such a way as to reduce the impacts on the environment. The objectives of mitigation are to:

- find more environmentally sound ways of doing things;
- enhance the environmental benefits of a proposed activity;
- avoid, minimize or remedy negative impacts, and
- ensure that residual negative impacts are within acceptable levels.

When mitigation is considered for certain impacts, it should be organized in a hierarchy of actions, namely:

- avoid negative impacts as far as possible through the use of preventative measures
- minimize or reduce negative impacts to 'as low as practicable' level, and
- remedy or compensate for negative residual impacts that are unavoidable and cannot be reduced further.

### 6.4 Impact Evaluation

The potential impacts identified were evaluated in terms of duration, extent, intensity, probability and status, in combination providing the expected significance. The means of arriving at the different significance ratings is described in Table below:

These criteria are used to ascertain the significance of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The significance of an impact is derived by taking into account the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

**Table 4:** Impact Assessment Methodology

CRITERIA	EXPANSION
<b>Impact</b>	A description or list of the expected impacts
<b>Nature</b>	Describes the type of effect of the impact in terms:  <b>Positive</b> - the project will have a social or economical or environmental benefit  <b>Neutral</b> - the project will have no effect  <b>Negative</b> - the project will have impacts that are likely to have harmful consequences
<b>Extent</b>	Describes the scale of the impact in terms of:  <b>Site Specific:</b> Impact expanding only as far as the activity itself, i.e. confined within the project site boundary.  <b>Small :</b> Impacts confined to the immediate environment of the site, i.e. within a radius of 1 km of the project site boundary  <b>Medium:</b> Impacts extend beyond the immediate environment of the site, i.e. within a radius of 5 km of the project site boundary (local)  <b>Large:</b> Impacts extend beyond the project site boundary and have a widespread effect i.e. beyond 5 km (regional)
<b>Duration</b>	Predicts the lifetime of the impact:  <b>Temporary:</b> Impacts expected to endure for less than 1 year  <b>Short term :</b> Impacts expected to endure for between 2 and 5 years.  <b>Medium term:</b> Impacts expected to endure for between 5 and 15 years.

CRITERIA	EXPANSION
	<p><b>Long term</b> : Impacts anticipated to endure for over 15 years. Impact will only stop after the operational or running lifespan of the activity, either due to natural course or by human inference)</p> <p><b>Permanent</b>: Impact will be where mitigation or moderation by natural course or by human interference will not occur in a particular means or in a particular time period that the impact can be considered temporary.</p>
<b>Intensity</b>	<p>Describes the magnitude (scale) of the impact</p> <p><b>Very Low</b> : Affects the environment in such a way that the natural and/or social functions/processes are not affected .</p> <p><b>Low</b> : Natural and/or social functions/processes are slightly affected.</p> <p><b>Medium</b>: The natural and/ or social functions/processes are notably altered but continue albeit in a modified way.</p> <p><b>High</b>: The natural, cultural or social functions or processes are alerted to the extent that it will permanently cease</p>
<b>Probability of Occurrence</b>	<p>Describes the probability of the impact actually occurring:</p> <p><b>Improbable</b>: Not at all likely that impact will occur.</p> <p><b>Probable</b>: Distinct possibility for impact to occur.</p> <p><b>Highly Probable</b>: Impact will most likely to happen.</p> <p><b>Definite</b>: Impact will occur irrespective of any preventative measures or correction action taken.</p>
<b>Degree of Confidence in Predictions</b>	<p>Degree of confidence in prediction is largely based on availability of information and any specialised knowledge:</p> <p><b>Low</b> : Less than 40% - little confidence regarding information available</p> <p><b>Medium</b>: Between 40% and 80%% - Moderate confidence regarding information</p> <p><b>High</b>: Over 80% - great confidence regarding information available.</p>
<b>Significance Rating</b>	<p>The Significance Rating of an impact on each component is determined by a combination of the above criteria where:</p> <p><b>No change</b>: A potential concern which was found to have no impact when evaluated.</p> <p><b>Very low</b>: Impacts will be site specific and temporary with no mitigation necessary.</p> <p><b>Low</b>: The impacts will have a minor influence on the proposed development and/or environment. These impacts require some thought to adjustment of the project design where achievable, or alternative mitigation measures.</p> <p><b>Moderate</b>: Impacts will be experienced in the local and surrounding areas for the life span of the development and may result in long term changes. The impact can be lessened or improved by an amendment in the project design or implementation of effective mitigation measures.</p> <p><b>High</b>: Impacts have a high magnitude and will be experienced regionally for at least the life span of the development or will be irreversible. The impacts could have the no-go proposition on portions of the development in spite of any mitigation measures that could be implemented.</p>

## 6.5 Additional Evaluation Criteria

Apart from the assessment criteria presented in the sections above, impacts are also evaluated and assessed based on:

- Cumulative impacts
- Reversibility
- Potential for irreplaceable loss of resources, and
- Level of confidence.

Cumulative impacts can arise from one or more activities and can be defined as being, either additive impacts, that is where it adds to the impact caused by other similar impacts or an interactive impact, that is when cumulative impact is caused by different impacts that combine to form a new impact.

Naturally, the level of confidence implies the level of certainty which the specialists have in the accuracy of their predictions in terms of the assessment conducted and its related determined significance. This is based on any factors that could bring into doubt the accuracy of the relevant predictions hence compromising the level of confidence in the assessment of a specific impact.

## **7. IDENTIFIED IMPACTS AND ASSESSMENTS**

Described in this section are identified impacts, both negative and positive, that are associated with the gravel extraction proposed by SPR. The assessments are based on the methodology presented in the preceding section. Since this is a greenfield operation, the impacts have been assessed for these phases:

- Planning;
- Construction;
- Operational; and
- Decommissioning.

### **7.1 The Planning Phase**

This phase does not present any environmental impacts as it entails only those aspects that are related to gathering of information with respect to the gravel resource:

- defining the gravel resource;
- conducting viability assessments;
- securing markets for the gravels;
- negotiating and securing access to the resource; and
- securing the necessary permits and licenses, i.e. ECC, Sand Mining from CoW, etc.

The EIA is also conducted during the planning phase and involves a public consultation process – during which identified stakeholders and Interested and Affected Parties (IAPs) are given an opportunity to raise any issues or concerns which they might have with respect to the project.

### **7.2 Construction Induced Impacts**

The assessment of the potential impacts associated with the construction phase is described in this section based on the methodology described in section 6 and presented in **Table 4**. Impacts associated with the following respects are assessed:

- Establishing of Infrastructure – access roads and a campsite;
- Siting of Gravel Extraction Blocks;
- Provision of services (water, electricity, etc.)

#### **7.2.1 Establishing of Infrastructure (Access road & a Campsite)**

A suitable site is to be selected on the farm for the purpose of establishing a campsite where to keep machinery, equipment and tools required for the gravel extraction operation. Servicing and maintenance of machinery and vehicles will also be performed at this site. In the event that some employees will be accommodated onsite, this premise will also be used for that purpose. To access the campsite and gravel extraction sites, suitable access routes have to be established by the applicant. It important that these factors are considered when selecting a suitable campsite are:

- Security
- Site drainage
- Wind directions
- Proximity to any available services (water and electricity sources)

The provision of such infrastructure will be associated with some environmental impacts as listed in Table below. Given the location, scale and the characteristics of the landscape, the impacts associated with the construction of

infrastructure (access roads and campsite) are rated to have a distinct possibility to occur i.e. the probability of occurrence is **highly probable** without mitigation but of a **low** intensity with mitigation..

**Table 5:** Impacts Associated with Establishing of Infrastructure

<b>Description of Impact(s)</b>	Loss of vegetation, loss of habitat and land surface disturbances through excavation and soil erosion
<b>Nature</b>	Negative
<b>Extent</b>	Site specific, but could extend beyond site without comply with the EMP
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Probable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Medium
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures</b>	
<ul style="list-style-type: none"> <li>• Where establishing a campsite and access routes, consideration should be given to select sites which allow minimum removal of vegetation and trees.</li> <li>• When constructing internal routes, the shortest route to the existing farm road should be selected. Any site to be excavated should be preceded by physical inspection and clearly demarcated with visible markings before any construction work commences.</li> <li>• Sensitive areas, watercourses and steep gradients should be avoided as far as is practically possible.</li> </ul>	

## 7.2.2 Provision of Services to the Operation

Assessments have been made with respect to providing the following services to the campsite.

### 7.2.2.1 WATER

The gravel extraction operation does not require the use of water, however, water is required at the campsite for personnel use (drinking, cooking, washing, etc.) and for use by machinery and equipment. At this stage, the scope of the operation does not justify laying down pipes to convey water to the campsite. The project water requirement can be met by trucking potable water to the operation and storing it onsite in a suitable container. Given the scale of the operation, a 5 000 liter tank should be able to meet the requirements of the operation for several weeks. There are no environmental impacts associated with the supply of potable water to the operation.

### 7.2.2.2 ELECTRICITY

The mobile crusher-screening plant that for use in the operation has its own onboard power generating unit and does not require the installation of electricity from the grid. This power unit uses diesel and has to be refueled at the work site. Diesel should be transported in a suitable fuel bowser and refueling correctly administered without any leaks. The mitigation measures recommended for environmental impacts associated with the handling of fuel have been dealt with under hazardous substances in the EMP.

### 7.2.2.3 SANITATION

A suitable portable toilet should be provided at the campsite with sinks for employees to wash their hands, forearms and faces. Hygiene products such as soap, hand sanitizers and drying towels or tissues should be provided at the toilet facility. Where a lockable toilet is provided, there is no need to provide separate toilets for male and female employees. As a guideline, one toilet is required per 15 people. Given the scale and scope of the project, the impacts associated with the provision of services to the project site can be rated as **Low** without mitigation and **Very Low** with mitigation.

**Table 6:** Assessment of Impacts Associated with Provision of Services

<b>Description of Impact(s)</b>	Poor sanitation could lead to unhygienic conditions around the campsite.
<b>Nature</b>	Negative
<b>Extent</b>	Small
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Probable
<b>Degree of Confidence</b>	Medium
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Very Low
<b>Mitigation Measures</b>	
<ul style="list-style-type: none"> <li>• Ensure that the toilet facility is well ventilated and sited away from any sensitive areas.</li> <li>• Comply with the EMP on sanitation.</li> </ul>	

### 7.2.3 Operation Induced Impacts

The assessment of potential impacts related to gravel extraction during the construction phase are presented in this section based on the assessment methodology already described. Assessments have been made with respect to:

- Socio-economic impacts
- Gravel extraction impacts
- Water (surface and groundwater) impacts
- Dust and gaseous emissions on ambient air quality
- Noise pollution
- Waste Management
- Impacts on floral diversity
- Impacts on faunal diversity
- Visual Intrusion Aspects
- Archaeological and cultural impacts
- Safety and Health Aspects

#### 7.2.3.1 THE SOCIO-ECONOMIC IMPACTS

The gravel extraction operation is expected to deliver positive impacts in the form of employment creation and boost to the local economy. Unemployment is a serious problem in Namibia particularly amongst the youth who make up the bulk of the population. The gravel extraction promoted by SPR will create and provide employment opportunities to about twelve (12). In economic terms, this benefit will accrue to about 48 people when a multiplier factor of 4 is applied which is quite significant.

Furthermore, the promoter is expected to fork out millions of Namibia Dollars in capital expenditure to procure the machinery, plant and equipment required for the operation. Payments is to be made for the earthmoving machinery (excavators, wheeled loader, etc.), mobile crushing-screening plants and tipper trucks which will deliver the gravel to construction sites around Windhoek. Such capital will be spent to local suppliers of goods and services hence boosting the local economy.

Additionally, the employees who will be hired and will receive salaries and wages from which taxes and social security contributions are deducted for payments to Social Security Commission, NamRa, etc. Furthermore, employees will spend their disposal incomes in the local economy through payments for rates and taxes, (water, electricity, refuse removal, etc. to the local municipality), education for their children, medical costs and procurement of groceries and

other basic human needs. The nature of the impacts associated with operation is therefore **positive** while the significance rating is **moderate**.

**Table 7: Assessment of Socio-economic Impacts**

<b>Description of Impact(s)</b>	Earning of an income /salary, support to family/relatives and improved standard of living. Increased local spending, good competition amongst local aggregate suppliers and community support through corporate social responsibilities.
<b>Nature</b>	Positive
<b>Extent</b>	Medium
<b>Duration</b>	Long term
<b>Intensity</b>	Medium
<b>Probability</b>	Highly Probable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Hire employees without discrimination on the basis of gender, race, religious or political affiliations.</li> <li>• Provide and offer on-the-job training opportunities for employees to improve their skills levels .</li> <li>• Procure and source goods and services from local businesses (spare parts, water, fuel, oil, lubricants, PPEs, stationeries, etc.).</li> <li>• Pay VAT, PAYE and income taxes due to NamRA.</li> <li>• Comply with all applicable rules and regulations.</li> </ul>	

#### 7.2.3.2 GRAVEL EXTRACTION IMPACTS

The extraction will be confined to those terraces in the off-channel floodplains situated at high elevation than the present-day KWR elevation. Such mining activities are likely to cause negative effects to the environment such as topsoil disturbances which could lead to erosion and sedimentation.

However, the impacts can be managed by developing a pro-active mining plan which ensures that the small-scale gravel operation is carried out in a sustainable manner. This will require preserving the topsoil and setting a limit on the amount of gravel to be mined from each block. Given the scale and scope of the operation, the impact significance is rated **Medium** without mitigation and **Low** when mitigation measures are implemented.

**Table 8: Assessment of Gravel Extraction Impacts**

<b>Description of Impact(s)</b>	Loss of vegetation and habitat, land surface disturbances through excavation, disturbances of topsoil profile, erosion and sedimentation.
<b>Nature</b>	Negative
<b>Extent</b>	Site specific
<b>Duration</b>	Short term – each gravel block is mined per year and thereafter rehabilitated
<b>Intensity</b>	Low
<b>Probability</b>	Definite
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Medium
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• The gravel extraction blocks should be preceded by carefully planning and each extraction site must be clearly demarcated and sited away from any sensitive areas and outside any visible flood plains.</li> <li>• The area chosen for the gravel block extraction should be the minimum reasonably required that involves the least removal of vegetation, plants and trees.</li> <li>• The topsoil constitutes all materials from the natural ground level down to a depth of at least 0.3 m and should be excavated and preserved for future rehabilitation of the gravel extraction blocks.</li> <li>• Topsoil to be stockpiled in heaps not exceeding 2 m in height and allow vegetation to grow on such topsoil stockpiles to ensure that the soil remains biological active.</li> <li>• Vehicles should not be allowed to drive over topsoil stockpiles.</li> </ul>	

- Leave a sediment buffer on the bedrock of 0.2 m thick.
- Mined out gravel blocks should be rehabilitated to pre-gravel extraction conditions.

### 7.2.3.3 WATER RESOURCES (SURFACE & GROUNDWATER)

Mining activities are performed by earthmoving machinery and equipment which are powered by fossil fuel (diesel). By its very nature, diesel is a hazardous substance with the potential to contaminate both surface and underground water. When fuel is incorrectly handled and stored, or when machinery and equipment are poorly maintained, fuel spills and leaks can occur resulting in environmental impacts. However, large quantities of fuel have to be released in the environment, as a single incident for contamination to reach the natural groundwater table which is not the case with this project. Little fuel will be used and handled.

There were no surface standing water or wetlands observed at the project site, but during the rainy season, surface or standing water can be expected at several localities around the project site. It is therefore crucial that any minor fuel spill or leaks from machines are treated as potentially environmental hazardous incidents and should be cleaned up. The impact significance with respect to the surface and groundwater is rated as **Low** without mitigation and **Very Low** with mitigation.

**Table 9: Assessment of Impacts on Water Resources**

<b>Description of Impact(s)</b>	Fuel leaks and spills can be environmentally hazardous
<b>Nature</b>	Negative
<b>Extent</b>	Site specific, but can be widespread depending on volume involved.
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Very Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Fuel spill or leaks on the soil should not be concealed by covering it with gravel but must be cleaned up by scooping out the fuel soaked soil.</li> <li>• Oil and fuel handling should be done on impermeable surfaces.</li> <li>• Hazardous items such as used oil filters, oil pumps, etc. should be thrown away in the field but must be stored in leak-proof containers until disposed of in a responsible manner.</li> <li>• Comply with the EMP.</li> </ul>	

### 7.2.3.4 DUST AND EMISSIONS ON AMBIENT AIR QUALITY

Dust is generated when gravel is mechanically handled, excavated, loaded into tipper trucks and processed through the mobile crush-screening plant. Transport of gravel to end-users on district road, D1499 will also involve some form of dust generation, but the number of trucks that will be used, is at the most three, and therefore quite small.

Gaseous emissions in the form of smoke is also released into the atmosphere by the earthmoving machinery and plants used in the operation. However, at 5 km from the B1 highway, the gravel extraction site is in close proximity to an area in which the ambient air quality is already impacted by the high traffic flow on the highway and the various industrial activities operated along the highway. Furthermore, the operation is conducted in an open air environment (not confined to specific space like underground) which allows emissions to escape to the atmosphere.

During peak production periods, a fleet of up to five tipper-end trucks will be used in the operation with each truck possibly collecting a maximum of five loads per day. Considering the scale and scope of the operation, the impact significance as a result of dust and gaseous emissions is rated **Low** with mitigation and **very low** with mitigation.

**Table 10: Assessment of Impacts from Dust and Emission**

<b>Description of Impact(s)</b>	Dust emissions from handling dry materials and driving on gravel road as well as noxious emissions from earthmoving machinery and equipment. Dust can be a health hazard and an amenity nuisance - causing irritations to the eyes and noses.
<b>Nature</b>	Negative
<b>Extent</b>	Site specific, but can be widespread depending on wind intensity and direction
<b>Duration</b>	Short term, operation is conducted for few hours in a day
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Very Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Ensure that all the machines used in the operation are regularly serviced and well maintained.</li> <li>• Limit speed on the access gravel road to 30km/hr.</li> <li>• Comply with the EMP</li> </ul>	

#### 7.2.3.5 IMPACTS OF NOISE DISTURBANCES

Sources of noise disturbances are likely to originate from machinery and plant used in the operations and from activities such as idling, revving, and possibly hooting of trucks. Such noise is not expected to impact on the ambient noise levels in the area. There are also no sensitive noise receptors (hotels or lodges) within a radius of 2 km of the project site.

The environmental impact as a result of noise generated by the gravel extraction operation has **Low** significance rating without mitigation and **very low** when mitigated.

**Table 11: Assessment of Impacts on Noise Disturbances**

<b>Description of Impact(s)</b>	Sources of noise pollution can be unnecessary long idling of machine and equipment, excessive engine revving, hooting, etc.
<b>Nature</b>	Negative
<b>Extent</b>	Site specific, but can travel far and wide when conditions are conducive
<b>Duration</b>	Short term, mostly during operation only
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Very Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Ensure that all the machines used in the operation are regularly serviced and well maintained.</li> <li>• Avoid unnecessary idling, hooting &amp; revving</li> <li>• Limit work to normal day light hours</li> <li>• Comply with the EMP</li> </ul>	

#### 7.2.3.6 WASTE MANAGEMENT

Waste, especially solid waste is a general problem in Namibia which poses a significant threat to human and environmental health. Widespread littering of cans, bottles and plastics has become a visual nuisance along major roads in the country which propelled Government to launch a nationwide cleanup campaign in 2017. This project will



generate some waste, albeit in small quantities, which has to be dealt with. The waste generated will be in one of the following forms:

- **Hazardous or industrial waste:** - waste oil, used lubricants, old batteries, oil filters, scrap metals, scrapped machines, old tyres, paints, conveyor rubber belts, hose pipes, etc.
- **Household or domestic waste:** these are items such as empty bottles, broken glasses, plastics, carry bags, old overalls, old safety shoes and redundant PPEs. Used water and human excretes will also be included under this waste type.
- **Office waste:** the waste in this category will be empty cartons, newspapers, magazines, papers, ink cartridges, obsolete office machines, old files, maps, pens, etc.

The gravel operation will have to develop a waste management plan to deal with the waste that will be generated at the campsite and gravel extraction blocks. Ideally, the waste management plan should include the four principles of waste management, reduce, re-use, recycle and recovery. Considering the scale and scope of the operation, the environmental impact related to waste generation and handling is rated **Low** with mitigation and **Very Low** with mitigation.

**Table 12: Impacts on Waste Management**

<b>Description of Impact(s)</b>	Visual nuisance and possibly unpleasant odour, health hazard. Waste lying can be an amenity nuisance.
<b>Nature</b>	Negative
<b>Extent</b>	Site specific, but could be widespread, i.e. windblown plastics, papers, etc.
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Low
<b>Significance Post-mitigation</b>	Very Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Develop an in-house waste handling policy and enforce compliance thereof.</li> <li>• Separate wastes generated, recycle where possible, etc.</li> <li>• Store hazardous waste in sealed containers and dispose to a suitable waste landfill</li> <li>• Train employees on waste identification and waste handling.</li> <li>• Maintain a high standard of housekeeping.</li> <li>• Comply with the EMP.</li> </ul>	

### 7.2.3.7 IMPACTS ON FAUNAL DIVERSITY

Most farms in the northwest section of the Windhoek district, making up the WGBCL (described elsewhere in the report) have game and livestock as their core farming activities. This is also the case with Farm Triangle. During the site visit, a few springbucks and monkeys were observed. Amongst the common reptiles likely to be encountered within the project site are: snakes, scorpions, lizards, and chameleons, mice and rats. Most wild animals have developed the ability to live around human activities while others will naturally free and migrate to safer environments.

Some bird nests were spotted on trees along D1499 some nests were quite old while others were relatively new or under construction. Naturally, birds will live choose to live in areas with natural surface water sources such as springs, or dams. Given the scale and scope of the envisaged project activities, the environmental impacts on the faunal diversity is rated as having a **Medium** significance without mitigation and **Low** with mitigation.

**Table 13: Assessment of Impact on Faunal Diversity**

<b>Description of Impact(s)</b>	Loss of grazing and habitats, risk of illegal hunting poaching by employees, etc.
<b>Nature</b>	Negative
<b>Extent</b>	Site specific
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Medium
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Ensure that gravel extraction blocks are safe and secured and do not pose a safety hazard to livestock and wildlife on the farm.</li> <li>• Maintain a high standard of housekeeping without littering of plastics and papers</li> <li>• Comply with the EMP</li> </ul>	

#### 7.2.3.8 IMPACTS ON FLORAL DIVERSITY

As described elsewhere in this report, the river banks of the KWR running through the farm are the natural habitat for the *Acacia erioloba*, a protected species which occurs within the project site. The trees have a wide distribution throughout the Khomas Hochland and not restricted to the project site. Other species with protected status is the Aloe plant which also occurs in the area. Adequate measures have been proposed in the EMP which should be implemented to ensure that, when and where such protected trees and or plant species are encountered, they are not damaged but protected by maintaining a broader sediment base around the tree.

With any mining related project, most destructive disturbance to the floral diversity will take place during the construction phase when the infrastructure (access roads, campsite, etc.) and services (water installation, electricity, etc.) are developed and extended to the project site.

During the operational phase, further destruction to the floral landscape can occur through poor management practices and irresponsible behaviour of personnel in the employment of the promoter (e.g. allowing off-road driving, uncontrolled access to sensitive areas, chopping down trees for purposes of collecting firewood, killing of snakes when they do not pose a danger to anyone, use of general poison, etc. However, behaviour and attitudes of the workforce can be influenced, corrected and changed by good management practices and by ensuring that training workshops on the environment and the EMP are provided during the induction process with regular follow ups during the lifespan of the operation. Considering the scale and scope of the operation, the environmental impact has a significance rating of **Moderate** without mitigation and **Low** when recommended mitigation measures are implemented.

**Table 14: Assessment of Impact on Floral Diversity**

<b>Description of Impact(s)</b>	Disturbance to the natural ecosystem, loss of vegetation during site clearing, chopping down trees to harvest firewood.
<b>Nature</b>	Negative
<b>Extent</b>	Small
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Improbable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Medium
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Gravel extraction should be limited to clearly defined mining blocks that are well demarcated. Any big trees or trees of protected species must be preserved and not uprooted.</li> </ul>	

- Comply with the EMP.

### 7.2.3.9 IMPACTS ON VISUAL ASPECTS

To a large extent, impacts of visual intrusions are dependent on the characteristics of the existing landscape, topography and the proximity of sensitivity receptors. For this gravel operation, sensitive receptors would be the travelling public using the gravel road (D1499) and to a certain extent the B1 highway leading in and out of the City of Windhoek. A handful of local sand mining operations are located on the outskirts of the town (Farm Aris, Okapuka, Osona and Brakwater) and within sight of the B1 highway.

This specific gravel operation is distant from any public roads leading in and out of the capital. In fact, there are no sensitive visual receptors within a radius of 3 km. The district road which provides access to the project site is used by the residents of the farms in the area and not so much by the general public.

Other than the earthmoving fleet and the mobile crush-screening plants stationed at the site, the project will not involve the erection of permanent tall structures. The impact Significance Rating for this activity is therefore **Very Low** with and without mitigation.

**Table 15:** Assessment on Visual Intrusion

<b>Description of Impact(s)</b>	Visual nuisance, loss of sense of place
<b>Nature</b>	Negative
<b>Extent</b>	Small
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Probable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Very Low
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Where possible site campsite out of sight of the district road D1499 which runs through the farm.</li> <li>• Comply with the recommendation of the EMP.</li> </ul>	

### 7.2.3.10 IMPACTS ON ARCHAEOLOGICAL, HERITAGE AND CULTURAL REMAINS

In 1964, a rare discovery of human fossils 'carbon dated' as being 3000 years old were discovered during normal farm maintenance on a neighbouring farm, Otjiseru No. 42. It is therefore evident that remains of archaeological and cultural heritage could be present in the area. The environmental Impact Significance Rating for this activity is **Very Low** with and without mitigation

**Table 16:** Assessment of Impacts on Archaeological Aspects

<b>Description of Impact(s)</b>	Potential damage to items of archaeological interests during extraction.
<b>Nature</b>	Negative
<b>Extent</b>	Small
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Probable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Very Low
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	

Train employees on what to do when items of archaeological or cultural heritage are unearthed and follow the steps outlined in the EMP.
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**7.2.3.11 IMPACTS ON HEALTH AND SAFETY ASPECTS**

The gravel operation should strive to create a good and safe working environment which is free of accidents, free of health hazards and associated impediments.

Safety is of paramount importance in the execution of the gravel mining and applicable industry safety standards should therefore be implemented and complied with by the promoter as neglect to do so could lead to incidents and accidents which are undesirable and often associated with costly consequences.

This EIA has been conducted during the time when the nation of Namibia is recovering from the devastating pandemic caused by the deadly SARS CoV-2, the virus that causes Coronavirus Disease 2019 (Covid-19). Whilst the rate of infections and Covid-19 cases have completely diminished, it is incumbent upon the employers to provide a safe and corona-free working environment and for the employees to comply with the control and prevention measures as stipulated by the Ministry of Health & Social Services.

**Table 17:** Assessment of Safety and Health Aspects

<b>Description of Impact(s)</b>	Poor safety and health management could lead to unhygienic conditions, unwanted incidents and possibly accidents, injuries, loss of assets or properties even loss of lives. unhygienic conditions,
<b>Nature</b>	Negative
<b>Extent</b>	Small
<b>Duration</b>	Short term
<b>Intensity</b>	Low
<b>Probability</b>	Probable
<b>Degree of Confidence</b>	High
<b>Significance Pre-mitigation</b>	Very Low
<b>Significance Post-mitigation</b>	Low
<b>Mitigation Measures:</b>	
<ul style="list-style-type: none"> <li>• Develop a Health and Safety Plan for the aggregate operation and train employees on such a safety plan</li> <li>• Develop an Emergency Response Plan for the aggregate operation</li> <li>• Develop an Accident Procedure Framework for the aggregate operation and train employees on such plans</li> <li>• Ensure employees are provided with suitable PPE and wearing thereof is enforced</li> <li>• Limit speed to 30 km/hour on all internal routes</li> </ul>	

## **8. EVALUATIONS**

### **8.1 Environmental Economics Criteria**

A final qualitative assessment is considered in terms of the criteria used in the field of Environmental Economics. These criteria are explained by Stauth (1983), namely:

- *Efficiency Criterion,*
- *Equity Criterion, and*
- *Intergenerational Equity Criterion*

#### **8.1.1 Efficiency Criterion:**

A project is considered to be efficient if it brings about a net benefit to society. If some people are made better off without anyone else being made worse off, then a project is considered efficient in environmental economics terms. This project will bring economic benefits to the construction sector in the capital city including employment benefits to the twelve (12).

The project will further contribute to the national coffers through VAT and income tax payments. Tax payment to Central Government will benefit the country as a whole. Furthermore, employees will spend their disposal incomes in the local economy through payments for municipal services (water, electricity, rates & taxes, etc), education for their children, etc. hence supporting and boosting the local economy.

#### **8.1.2 Equity Criterion**

The equity criterion relates to the distribution of costs and benefits in the affected society. A project is equitable if it brings about a situation in which the distribution of social well-being is improved.

The gravel extraction production will benefit local people without disadvantaging them in any way. Some grazing will be lost where the gravel extraction blocks are sited, but the area involved is minimal and can be successfully rehabilitated. The distribution of benefits will be somewhat limited as direct benefits from the project will naturally accrue to its employees, to the land owner and to the broader society through creation of work opportunities in those sectors which will utilize the end products.

#### **8.1.3 The Intergenerational Equity (or Sustainability) Criterion**

This criterion considers the economic impacts on future generations – i.e. it extends the considerations of equity to future generations. Thus a project should be able to make the present generation better off without making future generations worse off. It should be able to provide benefits to future generations without degrading the resource base that the society depends on for its wellbeing.

The gravel resource is relatively huge and can support the road building construction sector for many years into the future. The operation does not need the application of water and electricity which are in short supply in the national capital. Provided that the EMP is complied with, the project does not pose any significant threats to the environment, the human health and the wildlife roaming around on the property.

### **8.2 Conclusions and Recommendation**

Overall the economic benefits of the gravel production facility proposed by SPR outweigh the limited negative impacts on the natural environment.

The gravel resource is quite big and the closest resource to the end-users in the Brakwater, Elensheim Development and Lafrenz Industrial Areas. Supplying construction materials to these developments from Farm Triangle will be the preferred option with the least environmental impacts than sourcing such products south of Windhoek.

The gravel extraction operation will present low environmental impacts and, provided the recommendations proposed in the EMP are implemented, the negative impacts can be effectively mitigated. It is recommended that an ECC be granted to SPR for the purpose of gravel extraction from Farm Triangle No. 47.

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## **ANNEXURE : A**

Agreement between the Farm Owner and Smart Plant Rentals CC

# AGREEMENT

Entered into by and between

**MR HANS DIETER WISS**  
of farm OTJISEVA No 420, Windhoek

(hereinafter referred to as the "PROPRIETOR")

and

**SMART PLANT RENTALS CC**  
Registration Nr: CC/2016/00046  
of 21 Nguni street, Northern Industrial, Windhoek

(herein represented by Heinz J Schulze)

(hereinafter referred to as the "CONTRACTOR")

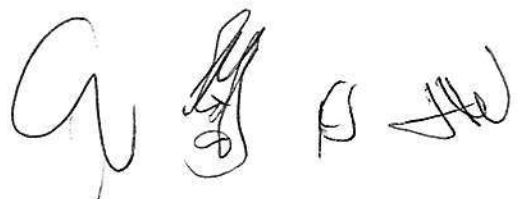
Whereas:

- The PROPRIETOR is the owner of the farm OTJISEVA No 420 and farm TRIANGLE No 47 (hereinafter referred to as the "FARM")
- The PROPRIETOR has granted the CONTRACTOR certain rights in respect of quarrying on the FARM upon the term and conditions of this agreement.

WHEREBY IT IS AGREED AS FOLLOWS:

## 1. GRANT OF RIGHTS

- 1.1 The PROPRIETOR hereby grants to the CONTRACTOR who hereby accepts the sole and exclusive right to quarry, extract and remove natural gravel and/or aggregate (hereinafter referred to as "MATERIAL") from the portion of the FARM as indicated in green on the aerial photo annexed hereto (hereinafter referred to as the "SITE") and generally for the purpose aforesaid to perform the operations connected with or incidental to quarrying, extracting and removing MATERIAL from the SITE.

The image shows four handwritten signatures in black ink, arranged horizontally. The first signature is a large, stylized 'A'. The second is a more complex, cursive signature. The third is a shorter, simpler signature. The fourth is a signature that appears to be 'HJ' followed by a flourish.



## 2. DURATION AND CANCELLATION

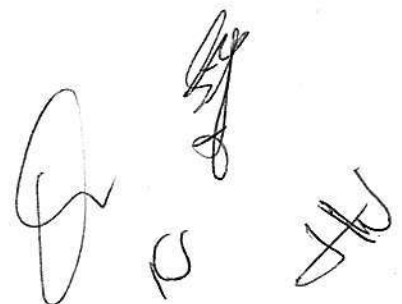
- 2.1 This AGREEMENT shall commence on date of signature of this agreement and shall continue for a period of 3 (three) year(s) with a 5 (five) year option to renew, provided that after expiry of the said initial period either party may terminate the agreement by giving the other party 3 (three) calendar months prior written notice of termination.
- 2.2 This AGREEMENT shall be terminated by the CONTRACTOR, when the CONTRACTOR cease to deal in aggregates and/or cease to operate its business, by giving the PROPRIETOR 3 (three) months written notice of its intention to terminate.
- 2.3 This AGREEMENT shall automatically and immediately terminate when all the aggregate sources at the SITE, at the designated area are depleted/exhausted.

## 3. ROYALTY

- 3.1 In consideration of the rights granted under this AGREEMENT the CONTRACTOR shall pay to the PROPRIETOR a monthly royalty of N\$28.00 per m<sup>3</sup> (twenty eight Namibia Dollar and zero cents per cubic meter) of MATERIAL removed from the SITE during the currency of the first year of this AGREEMENT. Thereafter the increase will be negotiated yearly.

## 4. MAINTENANCE OF RECORDS AND SUBMISSION OF STATEMENT

- 4.1 The CONTRACTOR shall maintain proper records showing the quantity of MATERIAL removed by it from the SITE and a statement showing the sum of royalty payable at the end of each and every calendar month shall be forwarded to the PROPRIETOR not later than the 10<sup>th</sup> day of the calendar month following, and payment of the sum due in terms of such statement shall simultaneously be effected. All return furnished by the CONTRACTOR to the PROPRIETOR as aforesaid shall at the end of each financial year be certified by the CONTRACTORS auditors as correct. Summary to be send to PROPRIETOR who will then send a Tax Invoice to the CONTRACTOR. Payment 30 days.

Handwritten signatures and initials at the bottom right of the page. There are three distinct signatures: a large, stylized signature on the left, a smaller signature in the middle, and another signature on the right. Below the middle signature are the initials 'RS'.

## 5. EXAMINATION OF RECORDS AND INSPECTION OF PORTIONS

5.1 The PROPRIETOR or his duly authorized representative shall be entitled at all reasonable times during working hours to examine and inspect the records of the CONTRACTOR referred to in paragraph 4.1 herein before, and shall further be entitled at all reasonable times during working hours for any purpose whatsoever to go upon the SITE and into the quarry workings and excavations to inspect the same, inspect the records and books recording the MATERIAL removed from the SITE and the CONTRACTOR shall afford the PROPRIETOR every facility for inspection of the records kept by him.

## 6. CONTRACTORS DUTIES IN CARRYING ON OPERATIONS

6.1 The CONTRACTOR shall at his costs construct and maintain any access roads over the FARM to the SITE and is not obliged to compensate the PROPRIETOR for the use of such roads. At the termination of this AGREEMENT the CONTRACTOR is not obliged to re-instate the land over which such access roads run. The CONTRACTOR shall assist in keeping the main road in a fair condition.

6.2 The CONTRACTOR shall maintain the SITE free from rubbish and litter.

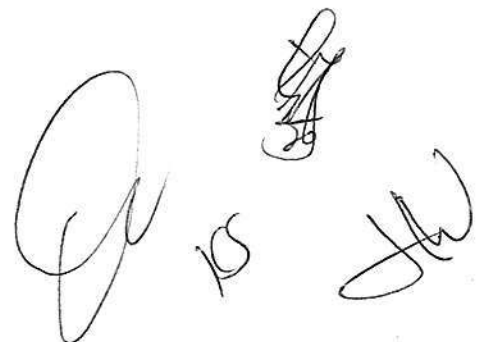
6.3 The CONTRACTOR shall keep the FARM gates closed and secure at all times when no hauling takes place, in particular during nights and weekends.

6.4 The CONTRACTOR shall carry out its operations on the SITE in a workmanlike and orderly manner.

6.5 The CONTRACTOR shall not carry out its operations on Sundays, public holidays or at night unless prior agreement to do so is reached with the PROPRIETOR.

6.6 The vegetation removed from the SITE, in particular trees, shall remain the property of the PROPRIETOR. No trees, as far as this is reasonable possible in the excavation process, shall be removed. Excavation around trees shall be such that the trees are reasonable safe.

6.7 At the termination of this agreement the CONTRACTOR is not obliged to reinstate the land on the SITE save the CONTRACTOR shall level of heaps of MATERIAL and overburden.

The bottom right corner of the document contains four handwritten signatures or initials. From left to right: a large, stylized signature; the initials 'KS'; a signature that appears to be 'S.A.'; and another signature that appears to be 'J.W.'.

6.8 The CONTRACTOR shall stay at least 100 meter from the public road. No direct excavation, if reasonably possible, should be done along the fences bordering to neighbors.

## 7. CONTRACTORS GENERAL RIGHTS

7.1 In the exercise of the rights granted in terms of this agreement the CONTRACTOR shall have the right to use and to have such access to and aggrs from the SITE as it may require with the right to make quarries and cuttings and any other works whatsoever which the CONTRACTOR may require in and about the bona fide carrying on of is operations.

## 8. RIGHT OF FIRST REFUSAL

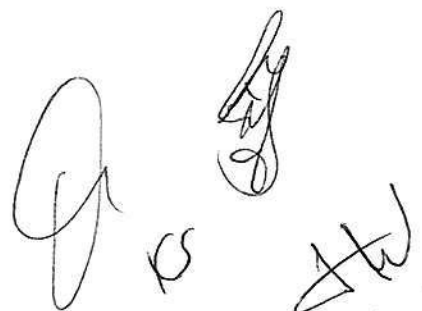
8.1 If the PROPRIETOR received an offer to purchase for the Farm Triangle (the FARM), which offer he is prepared to accept, then the PROPRIETOR shall forthwith send notice to the CONTRACTOR in writing that he is prepared to sell the FARM at the price and on the conditions stipulated in the offer to purchase.

8.2 The CONTRACTOR shall within 30 calendar days of receipt of the above notice confirm in writing whether he wished to exercise his option. If the CONTRACTOR wishes to exercise his option, he shall provide the PROPRIETOR with a guarantee from a reputable bank or credit provider for the full purchase price within the aforesaid 30 days.

8.3 This clause is subject to any regulations or conditions imposed by the City of Windhoek and/or the regional and/or national government.

## 9. BREACH

The PROPRIETOR shall have the right forthwith to terminate this agreement saving all the rights of the PROPRIETOR to sue for recover money due or damages for breach of contract in the event:

Handwritten signatures and initials in black ink, including a large stylized signature, the initials 'KS', and another signature.

9.1 The CONTRACTOR shall fail to make any payment on due date and shall fail to remedy such breach within 14 days of written notice by the PROPRIETOR to the CONTRACTOR to do so.

9.2 The CONTRACTOR shall commit a breach of any of the other terms of this agreement and shall fail to remedy such breach with 14 days of written notice by the PROPRIETOR to the CONTRACTOR to do so.

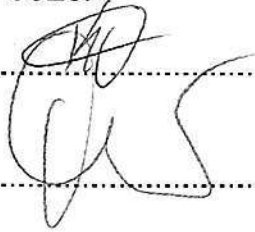
9.3 The CONTRACTOR shall not allow a "squatter camp" at the SITE and only four to eight employees of the CONTRACTOR are allowed at the SITE.

10. NON VARIATION


This contract constitutes the entire agreement between the parties. No variation, cancellation or amendment hereof shall be of any force and effect unless reduced to writing and signed by both parties.

Signed at Windhoek this Windhoek day of 24 November 2022.

AS WITNESSES:

1.  .....

2.  .....

  
.....  
PROPRIETOR

Signed at Windhoek this Windhoek day of 24 November 2022.

AS WITNESSES:

1.  .....

2.  .....

  
.....  
CONTRACTOR